

PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Appl. No. : 10/825,065

Appellants: DUYCK et al.

Filed : April 14, 2004

Title : KETONE DIARYLAMINE CONDENSATES

TC/A.U. : 1714

Examiner : Goloboy, J. C.

Docket No.: 0174-PA-CIP (UNI163US)

Mail Stop Appeal Brief – Patents
Commissioner of Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

APPELLANTS' APPEAL BRIEF

Sir:

The above-identified Appellants submit this Appellants' Appeal Brief pursuant to 37 C.F.R. § 41.37. The Notice of Appeal was filed on August 15, 2007.

Please charge the official fee of \$500 for filing a brief in support of an appeal to our Deposit Account Number 23-2656. A duplicate copy of this page is enclosed.

A separate request for a one-month extension of time accompanies this appeal brief.

The Appellants rely upon the following authorities and arguments to maintain the appeal.

1. Real Party in Interest

The real party in interest for this matter is the Appellants' assignee. The assignee and real party in interest are Chemtura Corporation, formerly known as Crompton Corporation, Benson Road, Middlebury, Connecticut 06749.

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2. Related Appeals and Interferences

There are no other appeals or interferences that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

3. Status of Claims

The status of the claims is as follows:

Claims 1, 5 through 9, 11 through 19, and 22 are pending in the application and are rejected and appealed. The procedural history behind this status of the claims is as follows:

Application No. 10/825,065 was filed on April 14, 2004. Claims 1 through 20 were originally filed.

In an Office Action of December 4, 2006, claims 1, 10, 11, and 20 were objected to for informalities, claims 1, 3, 4, and 7 through 10 were rejected under 35 U.S.C. § 102(b) as being anticipated by Wheeler et al. (U.S. Patent No. 5,268,394), and claims 1 through 20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wheeler et al. in view of Deetman (U.S. Patent No. RE37,101) in light of the evidence provided by Downs et al. (U.S. Patent No. 5,310,491).

In a Response of March 5, 2007, Appellants canceled claims 10 and 20, and added new claims 21 and 22.

In an Office Action of May 17, 2007, the Examiner made final the rejection of claims 1, 3, 4, 7 through 9, and 21 rejected under 35 U.S.C. § 102(b) as being anticipated by Wheeler et al. and the rejection of claims 1 through 9, 11 through 19, 21, and 22 under 35 U.S.C.

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§ 103(a) as being unpatentable over Wheeler et al. in view of Deetman in light of the evidence provided by Downs et al.

In a Response of July 11, 2007, the Appellants canceled claims 2 through 4, 10, 20, and 21, and added claim 22.

In an Advisory Action of July 31, 2007, the Examiner stated that the Appellants' amendment of July 11, 2007, overcame the 35 U.S.C. § 102(b) rejections of the claims by Wheeler et al. and maintained the rejection of claims 1, 5 through 9, 11 through 19, and 22 under 35 U.S.C. § 103(a) as being unpatentable over Wheeler et al. in view of Deetman in light of the evidence provided by Downs et al.

Appellants filed a Notice of Appeal on August 15, 2007.

4. Status of Amendments

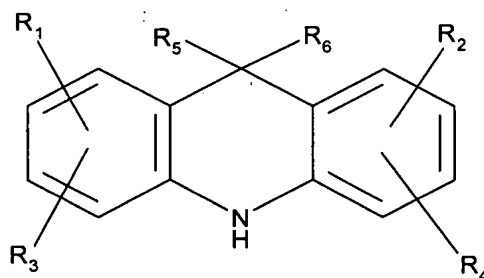
The amendment filed subsequent to the final rejection by the Examiner was entered by the Advisory Action. Therefore, the attached listing of claims reflects the claims proposed subsequent to the final Office Action of May 31, 2007.

5. Summary of Claimed Subject Matter

The present invention, as described in the specification at page 4 line 14, through page 5, line 6, page 7, line 16 through page 9, line 8, page 9, line 20, through page 10, line 3, and page 8, lines 11 through 17, is drawn to a composition comprising (A) a lubricant and (B) a mixture of antioxidants. The mixture of antioxidants is prepared by the partial condensation of an alkylated diphenylamine selected from the group consisting of mono-, di-, and tri-

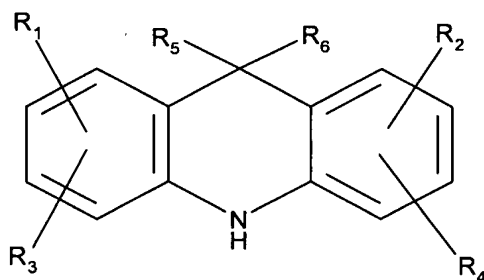
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nonylated diphenylamine and butylated octylated diphenylamine with an aldehyde or ketone in the presence of an acidic catalyst to yield at least one acridan of the general formula:



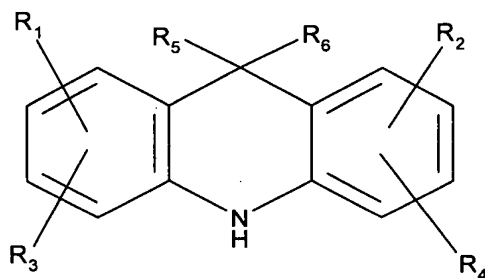
along with residual alkylated diphenylamine remaining after said partial condensation. R_1 , R_2 , R_3 , and R_4 are independently selected from the group consisting of hydrogen, butyl, octyl, and nonyl, provided that at least one of R_1 , R_2 , R_3 , and R_4 is not hydrogen. R_5 and R_6 are independently selected from the group consisting of C_1 to C_{20} hydrocarbyl and hydrogen. At the termination of the condensation, residual alkylated diphenylamine is not separated from the acridan product and remains in the mixture of antioxidants with the acridan. (See specification page 4, line 14, through page 5, line 6, page 7, line 16, through page 9, line 8, page 9, line 20, through page 10, line 3, and page 8, lines 11 through 17, and claim 1.)

In a second embodiment, as described in the specification at page 6, lines 4 through 20, page 7, line 16 through page 9, line 8, the present invention is drawn to a method for reducing the susceptibility of a lubricant to oxidation comprising adding to said lubricant a mixture of antioxidants. The antioxidant mixture is prepared by the partial condensation of an alkylated diphenylamine with an aldehyde or ketone in the presence of an acidic catalyst to yield at least one acridan of the general formula:



along with residual alkylated diphenylamine remaining after said partial condensation. R_1 , R_2 , R_3 , and R_4 are independently selected from the group consisting of hydrogen, C_3 to C_{32} alkyl, and C_3 to C_{32} alkenyl, provided that at least one of R_1 , R_2 , R_3 , and R_4 is not hydrogen. R_5 and R_6 are independently selected from the group consisting of C_1 to C_{20} hydrocarbyl and hydrogen. At the termination of the condensation, residual alkylated diphenylamine is not separated from the acridan product and remains in the mixture of antioxidants with the acridan. (See specification at page 6 lines 4 through 20, page 7, line 16, through page 9, line 8, and claim 11.)

In a third embodiment, as described in the specification at page 6, line 21, through page 7, line 14, page 7, line 16, through page 9, line 8, page 9, line 16, through page 10, line 3, the present invention is drawn to a method for reducing the susceptibility of a lubricant to oxidation comprising adding to said lubricant a mixture of antioxidants. The antioxidant mixture comprises (A) a second mixture of antioxidants comprising the products of the partial condensation of an alkylated diphenylamine with an aldehyde or ketone in the presence of an acidic catalyst. The products comprise (1) at least one acridan of the general formula:



wherein R_1 , R_2 , R_3 , and R_4 are independently selected from the group consisting of hydrogen, C_3 to C_{32} alkyl, and C_3 to C_{32} alkenyl, provided that at least one of R_1 , R_2 , R_3 , and R_4 is not hydrogen, and R_5 and R_6 are independently selected from the group consisting of C_1 to C_{20} hydrocarbyl and hydrogen, and (2) residual alkylated diphenylamine from the preparation of the acridan. The antioxidant mixture also comprises (B) at least one additional antioxidant selected from the group consisting of amine antioxidants, hindered phenol antioxidants, and mixtures thereof. (See specification page 6, line 21, through page 7, line 14, page 7, line 16, through page 9, line 8, page 9, line 16 through page 10, line 3, and claim 22.)

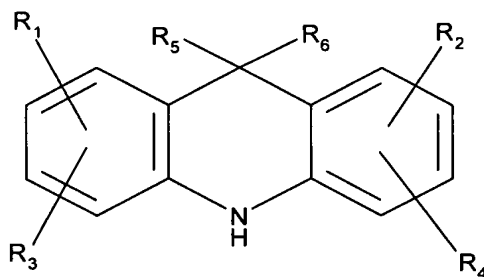
6. Grounds of Rejection to Be Reviewed on Appeal

Are claims 1, 5 through 9, 11 through 19, and 22 unpatentable under 35 U.S.C. § 103(a) over Wheeler et al. in view of Deetman in light of the evidence provided by Downs et al.?

7. Argument

The Background of the Invention

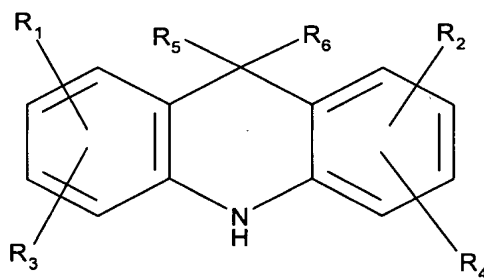
The claimed invention relates a class of lubricant additives that is derived from the condensation of an alkylated diphenylamine (ADPA) with a ketone or aldehyde in the presence of a suitable acidic catalyst. More particularly, the present invention relates to a composition comprising (A) a lubricant and (B) a mixture of antioxidants. The mixture of antioxidants is prepared by the partial condensation of an alkylated diphenylamine selected from the group consisting of mono-, di-, and tri-nonylated diphenylamine and butylated octylated diphenylamine with an aldehyde or ketone in the presence of an acidic catalyst to yield at least one acridan of the general formula:



along with residual alkylated diphenylamine remaining after said partial condensation. R₁, R₂, R₃, and R₄ are independently selected from the group consisting of hydrogen, butyl, octyl, and nonyl, provided that at least one of R₁, R₂, R₃, and R₄ is not hydrogen. R₅ and R₆ are independently selected from the group consisting of C₁ to C₂₀ hydrocarbyl and hydrogen. At the termination of the condensation, residual alkylated diphenylamine is not separated from the acridan product and remains in the mixture of antioxidants with the acridan.

In another aspect, the invention relates to a method for reducing the susceptibility of a lubricant to oxidation comprising adding to the lubricant a mixture of antioxidants, wherein the mixture is prepared as described above.

In yet another aspect, the invention relates to a method for reducing the susceptibility of a lubricant to oxidation comprising adding to the lubricant a mixture of antioxidants, wherein the mixture comprises (A) a second mixture of antioxidants comprising the products of the partial condensation of an alkylated diphenylamine with an aldehyde or ketone in the presence of an acidic catalyst. The products comprise (1) at least one acridan of the general formula:



wherein R_1 , R_2 , R_3 , and R_4 are independently selected from the group consisting of hydrogen, C_3 to C_{32} alkyl, and C_3 to C_{32} alkenyl, provided that at least one of R_1 , R_2 , R_3 , and R_4 is not hydrogen, and R_5 and R_6 are independently selected from the group consisting of C_1 to C_{20} hydrocarbyl and hydrogen, and (2) residual alkylated diphenylamine from the preparation of the acridan. The antioxidant mixture also comprises (B) at least one additional antioxidant selected from the group consisting of amine antioxidants, hindered phenol antioxidants, and mixtures thereof.

The Pending Rejection

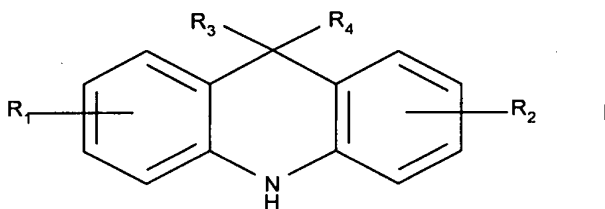
Are claims 1, 5 through 9, 11 through 19, and 22 unpatentable under 35 U.S.C. § 103(a) over Wheeler et al. in view of Deetman in light of the evidence provided by Downs et al.?

Claims 1, 5 through 9, 11 through 19, and 22 have been rejected under 35 U.S.C.

103(a) as being unpatentable over Wheeler et al. in view of Deetman (U.S. Patent No.

RE37,101) in light of the evidence provided by Downs et al. (U.S. Patent No. 5,310,491).

Wheeler et al. disclose the use of an acridan of Structure (I) as a stabilizer, preferably combined with hindered amine, phenolic, and phosphite stabilizers for stabilizing polyether polyols for polyurethane flexible foams and as stabilizers for the polyglycols, heat transfer fluids, and lubricating additives:



R₁, R₂, R₃, and R₄ can be H, C₁-C₁₈ alkyl, or C₇-C₁₈ aralkyl. R₃ and R₄ can also be aryl, preferably phenyl.

Deetman discloses a fluid composition suitable for use as an aircraft hydraulic fluid. The fluid composition comprises a fire-resistant phosphate ester base stock comprising between about 10% and about 100% by weight of a trialkyl phosphate, between about 0% and about 70% by weight of a dialkyl aryl phosphate, and from about 0% to about 25% by weight of an alkyl diaryl phosphate, with the proviso that the sum of the proportionate amount of each base stock component must equal 100%. The alkyl substituents of the trialkyl

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phosphate, the dialkyl aryl phosphate, and the alkyl diaryl phosphate contain between three and eight carbon atoms and are bonded to the phosphate moiety via a primary carbon. The fluid composition further comprises an acid scavenger, an anti-erosion additive, a viscosity index improver, and an antioxidant. An additive combination comprises a high molecular weight butyl/hexyl methacrylate viscosity index improver, a perfluoroalkylsulfonate anti-erosion additive, a 3,4-epoxycyclohexanecarboxylate or a diepoxide acid scavenger, a di(alkylphenyl)amine, and a phenolic antioxidant comprising a mixture of a 2,4,6-trialkylphenol and a hindered polyphenol compound selected from the group consisting of bis(3,5-dialkyl-4-hydroxyaryl)methane, 1,3,5-trialkyl-2,4,6-tris(3,5-di-tert-butyl-4-hydroxyaryl)benzene and mixtures thereof. Preferably, the fluid composition further comprises a benzotriazole derivative as a copper corrosion inhibitor, and a 4,5-dihydroimidazole derivative, as an iron corrosion inhibitor and to enhance the stability of the fluid.

Downs et al. disclose a lubricant composition containing the reaction product of an alkyl-substituted 1,2-dihydroquinoline and a diarylamine as antioxidant.

It is true that Wheeler et al. disclose that acridans can be used as lubricating additives. This fact has been acknowledged in the present specification. Wheeler et al. also disclose combining the acridans with certain amine stabilizers, phenolic stabilizers, and phosphite stabilizers. However, the patent teaches only the use of acridans that have been *separated* from the diphenylamine employed in their manufacture. The gist of the present invention lies in the discovery that such separation is unnecessary and that useful combinations of acridan and residual alkylated diphenylamine can be employed as stabilizers for lubricants without

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the manufacturing expense of separating them from the reaction mixture. The present claims stress this point. First, one reacts a mixture of an excess of an alkylated diphenylamine with an aldehyde and a ketone. When all the aldehyde or ketone has been used up in the reaction, there will still be unreacted alkylated diphenylamine left. How much will be left can be predetermined and regulated by the amount of aldehyde or ketone added. It may be a lot or a little depending on the desired qualities of the final mixture. One can then use this mixture of acridan and residual alkylated diphenylamine as is, without going to the manufacturing expense of separating the acridan and then adding additional antioxidants. Of course, additional stabilizers, e.g., antioxidants, can, if desired, be added to the unseparated acridan/alkylated diphenylamine composition, and, in fact, in a preferred embodiment, one or more amine antioxidants, which may be the same as or different from the residual diphenylamine of the composition, and/or hindered phenolic antioxidants are added. It is submitted that these alternatives are clearly specified in the claims of the present application.

The primary reference, as noted above, fails to disclose or suggest the economically desirable benefit of the present invention, i.e., the ability to omit the separation step of the newly formed acridan and the residual alkylated diphenyl amine. On the contrary, Wheeler et al. teach in column 4 that the crude reaction mixture, which contained diphenylamine, dimethylacridan, isopropyl diphenylamine, and dimers and trimers of various alkylated diphenyl amines was *carefully fractionally vacuum distilled*. Clearly, this procedure would add cost to the product which, by virtue of the teaching of the present inventors, can now be avoided.

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The Examiner has argued that the cost of Applicants' process versus the process of Wheeler et al. cannot be judged. Applicants disagree. Wheeler et al.'s starting material is an acridan that has been "carefully fractionally vacuum distilled." The starting material of the present invention is the crude undistilled acridan, which has to be cheaper than the purified material of Wheeler et al.. It goes without saying that in comparing the economics of two processes, other steps in such processes will have definite bearings on the *overall* cost, but it is undeniable that a process using unpurified starting material will always be cheaper than the same process using highly purified material. The situation here is clearly such a process and is a definite advantage of the present process over any comparable process of the prior art.

None of the secondary references supplements this deficiency of Wheeler et al. as a reference against the patentability of the present invention. Deetman merely discloses that numerous combinations of phenols and amines, one of many of which may be an acridan, can be used as antioxidants. Downs et al. disclose a reaction between a dihydroquinoline and diphenylamine - not the same reaction as that of the present invention - and teach the removal of excess diphenylamine by distillation. *See* column 5. In no case is there any hint of the use of unseparated product as the starting material disclosed by the present inventors.

Accordingly, it is requested that the rejection of claims 1-9, 11-19, 21, and 22 under 35 U.S.C. 103(a) as being unpatentable over Wheeler et al. in view of Deetman in light of the evidence provided by Downs et al. be withdrawn.

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Conclusion

The Appellants maintain that this file should be remanded to the Examiner for further prosecution or the rejections should be reversed. Favorable consideration of the application is respectfully requested.

8. **Claims Appendix**

An appendix is attached that contains a copy of the claims, as amended, that are involved in this appeal.

9. **Evidence Appendix**


The Appellants do not rely on additional evidence in this appeal.

10. **Related Proceedings Appendix**

The Appellants are unaware of any related proceedings.

Respectfully submitted,

15 Nov 2007
Date

 Reg. No. 30,754
for Daniel Reitenbach
Reg. No. 30,970

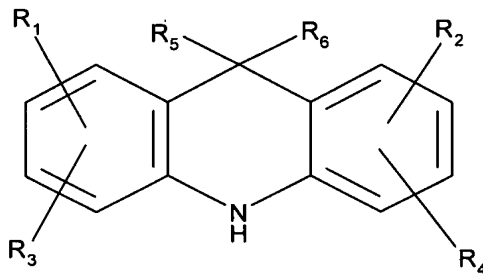
CHEMTURA CORPORATION
Benson Road
Middlebury, Connecticut 06749

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Claims Appendix

Listing of Claims:

1. (Previously Presented) A composition comprising:
- A) a lubricant; and
- B) a mixture of antioxidants, wherein said mixture is prepared by the partial condensation of an alkylated diphenylamine selected from the group consisting of mono-, di-, and tri-nonylated diphenylamine and butylated octylated diphenylamine with an aldehyde or ketone in the presence of an acidic catalyst to yield at least one acridan of the general formula:



along with residual alkylated diphenylamine remaining after said partial condensation;
wherein:

R₁, R₂, R₃, and R₄ are independently selected from the group consisting of hydrogen, butyl, octyl, and nonyl, provided that at least one of R₁, R₂, R₃, and R₄ is not hydrogen, and R₅ and R₆ are independently selected from the group consisting of C₁ to C₂₀ hydrocarbyl and hydrogen;

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wherein, at the termination of said condensation, residual alkylated diphenylamine is not separated from the acridan product and remains in said mixture of antioxidants with said acridan.

2 - 4 (Canceled)

5. (Previously Presented) The composition of claim 1 wherein the alkylated diphenylamine is condensed with a ketone.

6. (Original) The composition of claim 5 wherein the ketone is acetone.

7. (Previously Presented) The composition of claim 1 wherein the composition further comprises at least one antioxidant in addition to that provided by the mixture of acridan and residual alkylated diphenylamine.

8. (Original) The composition of claim 7 wherein the additional antioxidant is selected from the group consisting of amine antioxidants, hindered phenol antioxidants, and mixtures thereof.

9. (Original) The composition of claim 8 wherein the hindered phenol antioxidant is selected from the group consisting of 2,4-dimethyl-6-octyl-phenol; 2,6-di-t-butyl-4-methyl phenol; 2,6-di-t-butyl-4-ethyl phenol; 2,6-di-t-butyl-4-n-butyl phenol; 2,2'-methylenebis(4-

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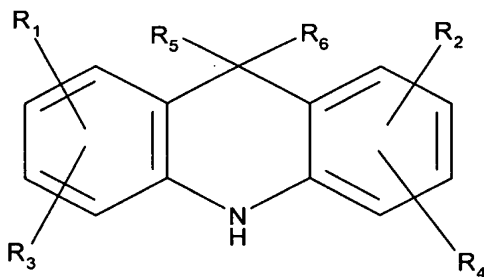
methyl-6-t-butyl phenol); 2,2'-methylenebis(4-ethyl-6-t-butyl-phenol); 2,4-dimethyl-6-t-butyl phenol; 4-hydroxymethyl-2,6-di-t-butyl phenol; n-octadecyl-beta(3,5-di-t-butyl-4-hydroxyphenyl)propionate; 2,6-dioctadecyl-4-methyl phenol; 2,4,6-trimethyl phenol; 2,4,6-triisopropyl phenol; 2,4,6-tri-t-butyl phenol; 2-t-butyl-4,6-dimethyl phenol; 2,6-methyl-4-didodecyl phenol; tris(3,5-di-t-butyl-4-hydroxy isocyanurate; tris(2-methyl-4-hydroxy-5-t-butylphenyl)butane; 3,5-di-t-butyl-4-hydroxy hydrocinnamate; octadecyl-3,5-di-t-butyl-4-hydroxy hydrocinnamate; tetrakis{methylene(3,5-di-t-butyl-4-hydroxy-hydrocinnamate)}methane; 1,2-bis(3,5-di-t-butyl-4-hydroxyhydrocinnamoyl)hydrazine; 1,3,5-tris(3,5-di-t-butyl-4-hydroxybenzyl)-s-triazine-2,4,6 (1H,3H,5H)trione; 2,2'-oxamido bis-{ethyl-3-(3,5-di-t-butyl-4-hydroxyphenyl)}propionate; 1,3,5-tris(4-t-butyl-3-hydroxy-2,6-dimethylbenzyl)-s-triazine-2,4,6-(1H,3H,5H)trione; 1,3,5-trimethyl-2,4,6-tris(3,5-di-t-butyl-4-hydroxybenzyl)benzene; 3,5-di-t-butyl-4-hydroxyhydrocinnamic acid triester with 1,3,5-tris(2-hydroxyethyl)-5-triazine-2,4,6(1H,3H,5H)-trione; bis(3,3-bis(4-hydroxy-3-t-butylphenyl)butanoic acid)glycolester; tetrakis{methylene (3,5-di-t-butyl-4-hydroxy-hydrocinnamate)}methane; 1,3,5-trimethyl-2,4,6-tris(3,5-di-t-butyl-4-hydroxybenzyl)benzene; and 3,5-di-t-butyl-4-hydroxy-hydrocinnamic acid C₇-C₉ branched alkyl ester.

10. (Canceled)

11. (Previously Presented) A method for reducing the susceptibility of a lubricant to oxidation comprising adding to said lubricant a mixture of antioxidants, wherein said mixture

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is prepared by the partial condensation of an alkylated diphenylamine with an aldehyde or ketone in the presence of an acidic catalyst to yield at least one acridan of the general formula:



along with residual alkylated diphenylamine remaining after said partial condensation;

wherein:

R₁, R₂, R₃, and R₄ are independently selected from the group consisting of hydrogen, C₃ to C₃₂ alkyl, and C₃ to C₃₂ alkenyl, provided that at least one of R₁, R₂, R₃, and R₄ is not hydrogen, and R₅ and R₆ are independently selected from the group consisting of C₁ to C₂₀ hydrocarbyl and hydrogen;

wherein, at the termination of said condensation, residual alkylated diphenylamine is not separated from the acridan product and remains in said mixture of antioxidants with said acridan.

12. (Original) The method of claim 11 wherein the alkylated diphenylamine is selected from the group consisting of mono-, di-, and tri-nonylated diphenylamine and butylated octylated diphenylamine.

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13. (Original) The method of claim 11 wherein the alkylated diphenylamine is condensed with a ketone.
14. (Original) The method of claim 13 wherein the ketone is acetone.
15. (Original) The method of claim 12 wherein the alkylated diphenylamine is condensed with a ketone.
16. (Original) The method of claim 15 wherein the ketone is acetone.
17. (Original) The method of claim 11 wherein the composition further comprises at least one antioxidant in addition to that provided by the mixture.
18. (Original) The method of claim 17 wherein the additional antioxidant is selected from the group consisting of amine antioxidants, hindered phenol antioxidants, and mixtures thereof.
19. (Original) The method of claim 18 wherein the hindered phenol antioxidant is selected from the group consisting of 2,4-dimethyl-6-octyl-phenol; 2,6-di-t-butyl-4-methyl phenol; 2,6-di-t-butyl-4-ethyl phenol; 2,6-di-t-butyl-4-n-butyl phenol; 2,2'-methylenebis(4-methyl-6-t-butyl phenol); 2,2'-methylenebis(4-ethyl-6-t-butyl-phenol); 2,4-dimethyl-6-t-butyl phenol; 4-hydroxymethyl-2,6-di-t-butyl phenol; n-octadecyl-beta(3,5-di-t-butyl-4-

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hydroxyphenyl)propionate; 2,6-dioctadecyl-4-methyl phenol; 2,4,6-trimethyl phenol; 2,4,6-triisopropyl phenol; 2,4,6-tri-t-butyl phenol; 2-t-butyl-4,6-dimethyl phenol; 2,6-methyl-4-didodecyl phenol; tris(3,5-di-t-butyl-4-hydroxy isocyanurate); tris(2-methyl-4-hydroxy-5-t-butylphenyl)butane; 3,5-di-t-butyl-4-hydroxy hydrocinnamate; octadecyl-3,5-di-t-butyl-4-hydroxy hydrocinnamate; tetrakis{methylene(3,5-di-t-butyl-4-hydroxy-hydrocinnamate)}methane; 1,2-bis(3,5-di-t-butyl-4-hydroxyhydrocinnamoyl)hydrazine; 1,3,5-tris(3,5-di-t-butyl-4-hydroxybenzyl)-s-triazine-2,4,6 (1H,3H,5H)trione; 2,2'-oxamido bis-{ethyl-3-(3,5-di-t-butyl-4-hydroxyphenyl)}propionate; 1,3,5-tris(4-t-butyl-3-hydroxy-2,6-dimethylbenzyl)-s-triazine-2,4,6-(1H,3H,5H)trione; 1,3,5-trimethyl-2,4,6-tris(3,5-di-t-butyl-4-hydroxybenzyl)benzene; 3,5-di-t-butyl-4-hydroxyhydrocinnamic acid triester with 1,3,5-tris(2-hydroxyethyl)-5-triazine-2,4,6(1H,3H,5H)-trione; bis(3,3-bis(4-hydroxy-3-t-butylphenyl)butanoic acid)glycolester; tetrakis{methylene (3,5-di-t-butyl-4-hydroxy-hydrocinnamate)}methane; 1,3,5-trimethyl-2,4,6-tris(3,5-di-t-butyl-4-hydroxybenzyl)benzene; and 3,5-di-t-butyl-4-hydroxy-hydrocinnamic acid C₇-C₉, branched alkyl ester.

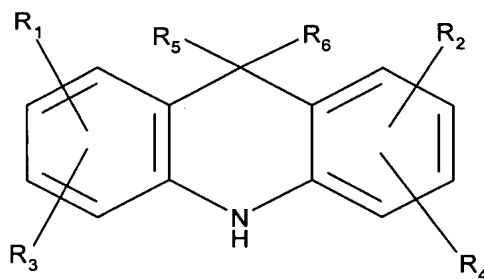
20 - 21 (Canceled)

22. (Previously Presented) A method for reducing the susceptibility of a lubricant to oxidation comprising adding to said lubricant a mixture of antioxidants, wherein said mixture comprises:

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(A) a second mixture of antioxidants comprising the products of the partial condensation of an alkylated diphenylamine with an aldehyde or ketone in the presence of an acidic catalyst, wherein said products comprise:

(1) at least one acridan of the general formula:



wherein:

R₁, R₂, R₃, and R₄ are independently selected from the group consisting of hydrogen, C₃ to C₃₂ alkyl, and C₃ to C₃₂ alkenyl, provided that at least one of R₁, R₂, R₃, and R₄ is not hydrogen, and R₅ and R₆ are independently selected from the group consisting of C₁ to C₂₀ hydrocarbyl and hydrogen, and

(2) residual alkylated diphenylamine from the preparation of the acridan;

and

(B) at least one additional antioxidant selected from the group consisting of amine antioxidants, hindered phenol antioxidants, and mixtures thereof.

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Evidence Appendix

The Appellants do not submit any further evidence pursuant to 37 C.F.R. §§ 1.130, 1.31, or 1.132.

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Related Proceedings Appendix

No decisions rendered by a court or the Board in any proceeding identified pursuant to 37 C.F.R. § 41.38(c)(1)(ii) are known to the Appellants.